Joe
Darrell

FILE

CP&L

Carolina Power & Light Company
PO Box 165
New Hill NC 27562

William R. Robinson
Vice President
Harris Nuclear Plant

AUG 8 1996

SERIAL: HNP-96-131

United States Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

SHEARON HARRIS NUCLEAR POWER PLANT
DOCKET NO. 50-400/LICENSE NO. NPF-63
SPENT FUEL SURVEY COMMITMENTS

Dear Sir or Madam:

By letter dated July 1, 1996 and received July 8, 1996, the NRC requested that CP&L acknowledge and provide projected completion dates for commitments made for spent fuel related activities at the Harris Nuclear Plant (HNP). Specifically, CP&L was requested to confirm that: (1) the current spent fuel pool heatload analysis will be updated for current and future practices/assumptions; (2) the HNP FSAR will be revised to address the full-core off-loads, including the clarification or deletion of terminology such as "normal" and "abnormal;" and (3) the HNP FSAR will be revised to reflect the current as-installed spent fuel pool configuration.

Since these committed activities are interrelated, they will be completed concurrently prior to the commencement of fuel off-load for the next refueling outage, currently scheduled to begin in March 1997.

Questions regarding this matter may be referred to Mr. T. D. Walt at (919) 362-2711.

Sincerely,

LSR/lsr

c: Mr. J. B. Brady-NRC Senior Resident Inspector
Mr. S. D. Ebneter-NRC Regional Administrator
Mr. N. B. Le-NRC Project Manager

F/9

FILE

Bob
This is presentation package for Washington visit

F116

HNP Spent Fuel Pool 'C' and 'D' Activation

Project Status

March 3, 1998

CP&L

Meeting Objectives

- Present purpose, scope, and schedule for HNP spent fuel pool 'C' and 'D' activation project
- Identify NRC submittals
  - Potential USQ for modification to complete Component Cooling Water (CCW) tie-ins to fuel pool cooling and cleanup system
  - ASME Section III relief request for fuel pool cooling system piping
  - Tech Spec change for high density racks
- Discuss development of submittals
  - Separate submittals vs single, comprehensive submittal

Discussion Topics

- Background/History
  - Original Design
  - Spent Fuel Shipping Plan
  - Options Considered
- Schedule
- Project scope and anticipated licensing activities
  - Complete cooling and cleanup system for pools 'C' and 'D'
    - Potential USQ for CCW System Tie-in
  - ASME Section III certification for installed piping
    - ASME Section III relief request
  - Rack Design and Pool Analysis
    - Tech Spec change for high density racks
- Summary

Background/History

- Original HNP Design
  - Four (4) nuclear units; four (4) fuel pools; two (2) cooling systems
- Units 2, 3 and 4 canceled in early 1980's,
  - All four pools completed
  - Pools 'A' and 'B' placed in service to support HNP Unit 1 and spent fuel shipping from BNP and RNP
  - Cooling system for pools 'C' and 'D' was not completed
  - Plan at time of Unit 1 license was to complete cooling system and place pools 'C' and 'D' in service when necessary

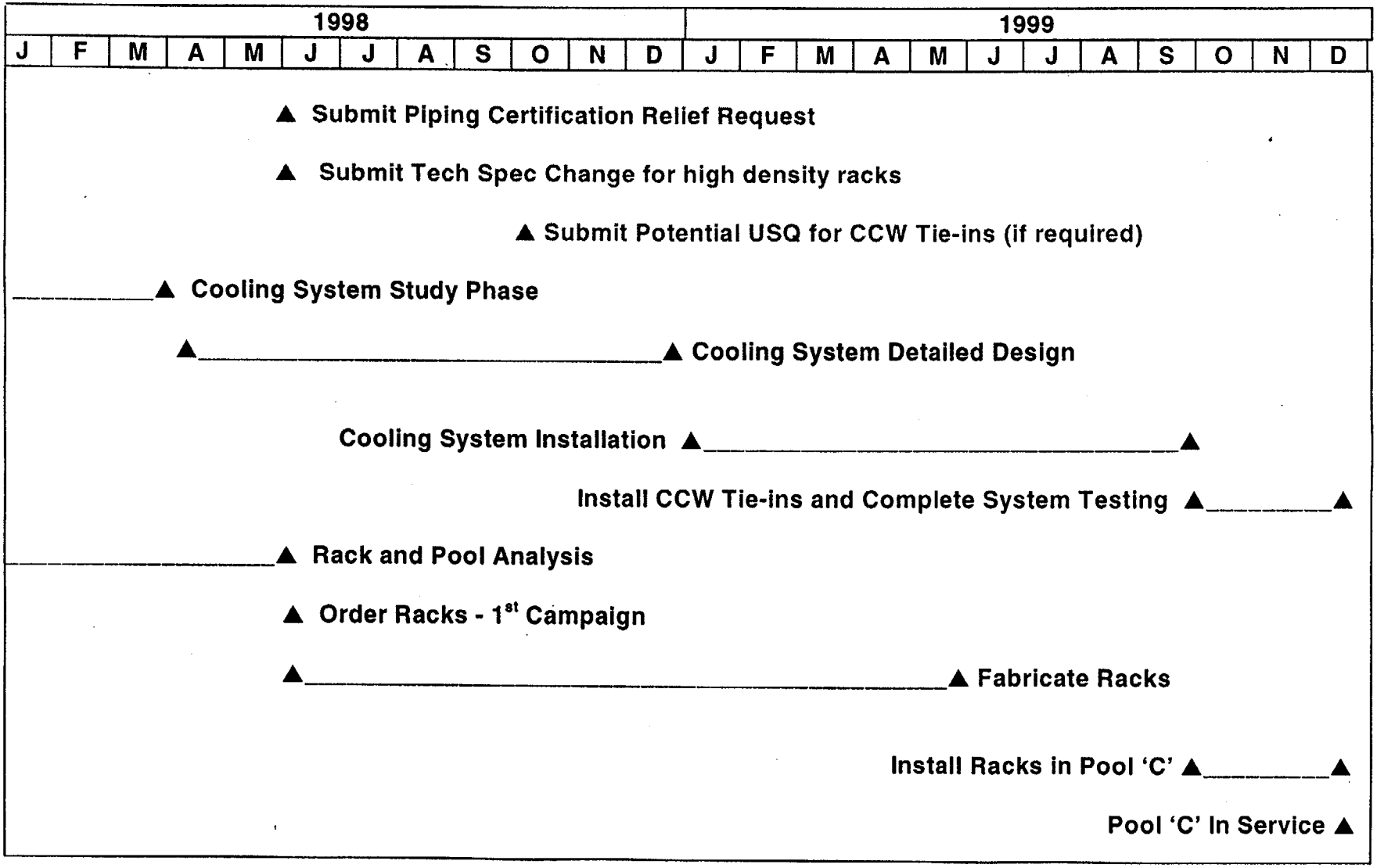
Background/History (Continued)

- Some installation documentation not available
  - System cannot be certified to ASME Section III without all documentation
- Fuel Pool 'C' is needed in early 2000 to support spent fuel shipping requirements from BNP and RNP
- Without pool 'C'
  - All 4 units lose prudent operating reserve by Spring 2000
  - HNP loses full core reserve in fall 2001
  - HNP forced shutdown in 2006

Background/History (Continued)

- Pools 'C' and 'D' (using optimized rack designs) are needed to provide spent fuel storage capacity for all four units through end of licensed life
  - BNP and RNP pools will be full when licenses expire
  - Additional storage capacity (such as dry storage facilities) will be needed if life extension is pursued at any of the units

Schedule


1998
1999
J F M A M J J A S O N D J F M A M J J A S O N D
▲ Submit Piping Certification Relief Request
▲ Submit Tech Spec Change for high density racks
▲ Submit Potential USQ for CCW Tie-ins (if required)
▲ Cooling System Study Phase
▲ ▲ Cooling System Detailed Design
Cooling System Installation ▲ ▲
Install CCW Tie-ins and Complete System Testing ▲ ▲
▲ Rack and Pool Analysis
▲ Order Racks - 1st Campaign
▲ ▲ Fabricate Racks
Install Racks in Pool 'C' ▲ ▲
Pool 'C' In Service ▲

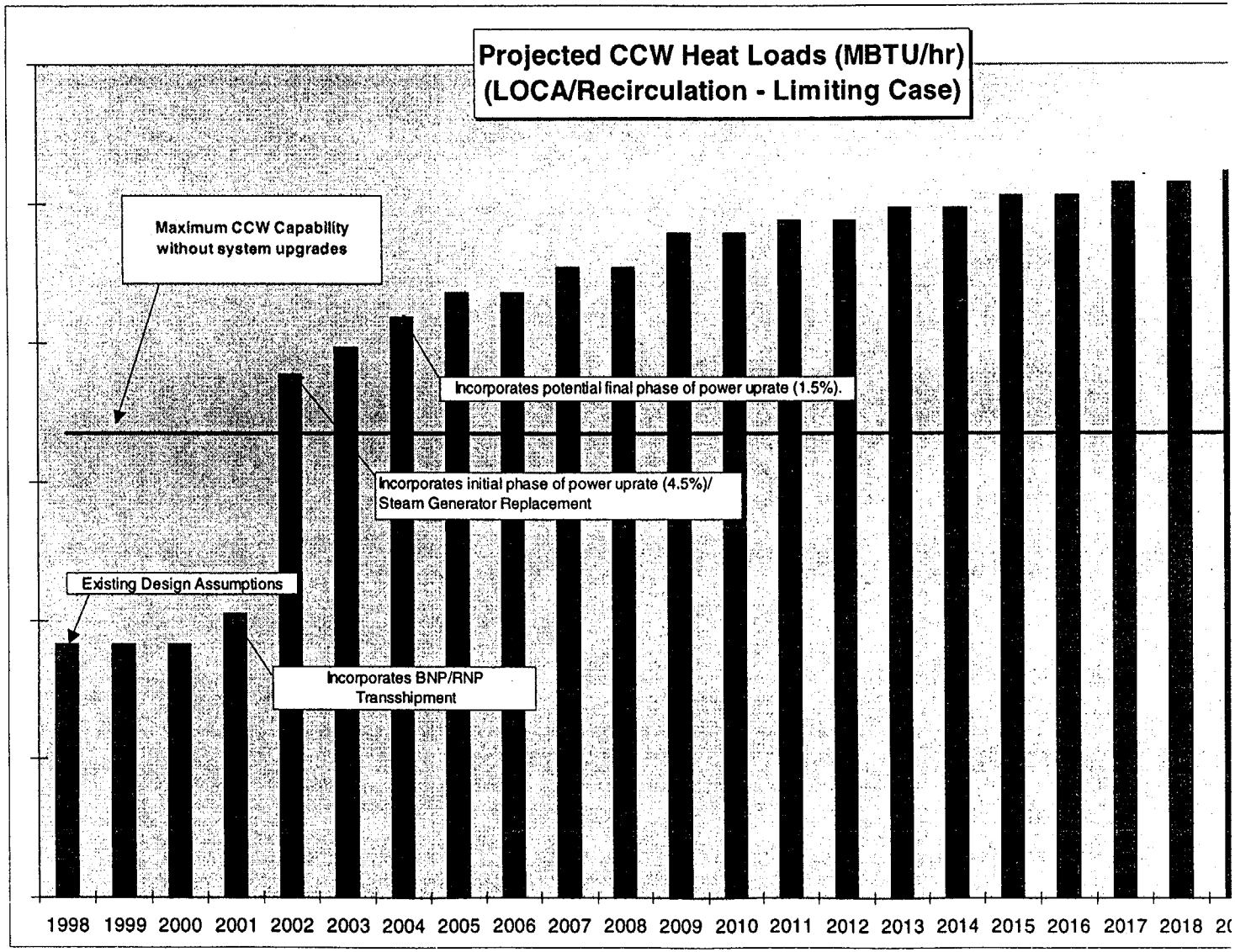
SFP Cooling Options Considered

- Independent Cooling
  - With and without dedicated emergency diesel generators
- Unit 1 Component Cooling Water (CCW)
  - 'As Is' (current design assumptions)
  - CCW with some changes in design assumptions (fouling factors, tube plugging limits, flow rates, IST limits, etc.)
  - CCW with system modifications to improve thermal-hydraulic performance
- Dry storage facilities instead of pools 'C' and 'D'

Cooling System Completion

- Use CCW to provide cooling to fuel pool cooling
  - Phase 1 - Complete fuel pool cooling loop work and tie-ins to CCW (1998-1999)
    - Existing system adequate for near-term operation until power uprate is implemented
  - Phase 2 - Perform CCW system upgrade concurrent with power uprate (1999 - 2001)
    - Final scoping and detailed design/implementation to occur after sufficient power uprate analysis has been completed

Projected CCW Heat Loads



Cooling System Licensing Activities

- 10CFR50.59 for tie-in to CCW may be identified as potential unreviewed safety question
  - Adding additional cooling load to existing CCW system
- Detailed design will start in April 1998
- Expect plant modification package with 50.59 this fall
  - Design schedule has not been negotiated with AE
- Will submit to NRC as soon as available

Certification of Installed Piping

- Cooling system piping originally designed and installed to ASME Section III requirements
  - Section III program in place
    - Included approved procedures, certified welders, certified materials, and required inspections/tests performed
- All new piping will be designed and installed to ASME Section III requirements

Certification of Installed Piping (Cont.)

- Records are available for all shop welds on piping abandoned during construction (209 of 248 welds)
- Field installation records generally not available (39 of 248 welds)
  - Weld data reports, test records, welder qualification not available
  - Portion of piping is embedded and not accessible for NDE (14 welds of 39 field welds)
- Plan to inspect accessible welds (visual and liquid penetrant) and pressure test complete system

Piping Certification Licensing Activities

- Relief from ASME Section III certification for fuel pool cooling system is required
- Developing plan now
- Expect to submit in early summer
- Plan to perform inspections/tests concurrent with installation activities for new equipment

Original Fuel Rack Design

- Original design for racks in pools 'C' and 'D'
  - Same as existing design for racks in pools 'A' and 'B'
  - Cell Pitch (Center-to-center spacing)
    - PWR racks - 10.5"
    - BWR racks - 6.25"
- Pool Capacity
  - Pool C - 520 PWR Cells
    2662 BWR Cells
    3182
  - Pool D - 680 PWR Cells
  - Total 3862 Cells

Optimized Rack Design

- SFP Optimization Plan for pools 'C' and 'D'
  - Cell Pitch
    - PWR - 9.0"
    - BWR - 6.25"

		Additional Cells
Optimized Pool Capacity		
Pool C -		
11 PWR Racks	927 PWR Cells	407 PWR
19 BWR Racks	2763 BWR Cells	101 BWR
	3690	508
Pool D -		
12 PWR Racks	1025 PWR Cells	345 PWR
Total	4715 Cells	853

Optimized Rack Design (Continued)

- First Campaign of Racks
  - Install late 1999
  - 4 PWR racks - 360 cells
  - 10 BWR racks - 1320 cells
- Racks will be Region 2 style
  - Neutron absorber material - Boral
  - PWR enrichment/burnup limitations
  - Administrative controls will be in place
  - No BWR Racks enrichment/burnup limitation since criticality analyses performed for maximum reactivity over burnup

Optimized Rack Design (Continued)

- HNP high-density rack design has been successfully licensed and installed at other plants
- PWR and BWR rack sizes selected to be inter-changeable

Holtec Analysis Report

- License Report
  - In accordance with NRC Guidance for Review and Acceptance of Spent Fuel Storage and Handling Applications
- Supporting Analyses
  - Heavy Load and Construction Considerations
  - Criticality
  - Thermal-Hydraulic
  - Structural and Seismic
  - Radiological Evaluation

Pool/Rack Licensing Activities

- Tech Spec Change required for high density racks
  - Driven by PWR pitch change
- Finalizing analysis and report now
- Plan to submit early summer

Summary

- Pool 'C' needs to be in service in early 2000
- Tech Spec Change for high density racks
  - Submit early summer 1998
- Fuel pool cooling phase 1 - complete system and tie-in to CCW (1998-1999)
  - ASME Section III certification relief required due to unavailable field documentation
    - Submit early summer 1998
  - Potential USQ for CCW tie-in anticipated
    - Submit fall 1998 pending AE design schedule
- Fuel pool cooling phase 2 - determine CCW system upgrades required to support power uprate (1999-2001)

F/11

Harris Spent Fuel Pool 'C' and 'D' Activation

Project Update
July 16, 1998

CP&L

Enclosure 2

Discussion Topics

- Introduction
  - Background
  - Project Scope/ Status
  - Schedule
- Rack Design/ Tech Spec Change
- CCW Tie-in 50.59 evaluation
- Alternative Plan for Piping Certification

Background

- Original HNP Design
  - Four (4) nuclear units; four (4) fuel pools; two (2) cooling systems
  - Pools 'A' and 'B' to support Units 1 and 4
  - Pools 'C' and 'D' to support Units 2 and 3
  - A separate, fully-redundant, 100% capacity cooling and cleanup system for each set of pools
    - Pool 'C' and 'D' cooling system to be supported by Unit 2 CCW and Unit 2 electrical systems

Background (Continued)

- Units 2, 3 and 4 canceled in early 1980's,
  - All four pools completed
  - Pools 'A' and 'B' placed in service to support HNP Unit 1 and spent fuel shipping from BNP and RNP
  - Cooling system for pools 'C' and 'D' was not completed
    - Construction stopped when unit 2 canceled in 1983
- Plan at time of Unit 1 license was to complete cooling system and place pools 'C' and 'D' in service when necessary
- Fuel Pool 'C' is needed in early 2000 to support spent fuel shipping requirements from BNP and RNP

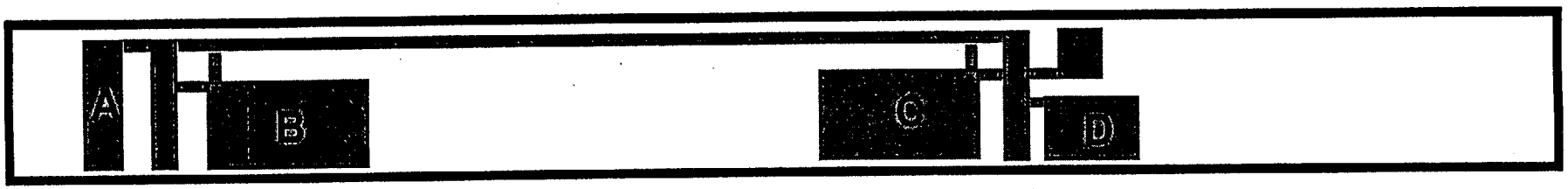
Background (Continued)

- Pools 'C' and 'D' (using optimized rack designs) are needed to provide spent fuel storage capacity for all four units through end of licensed life
  - BNP and RNP pools will be full when licenses expire
  - Additional storage capacity (such as dry storage facilities and reracking of pools 'A' and 'B') will be needed when life extension is pursued at any of the units
- Some installation documentation not available
  - System cannot be certified to ASME Section III without all documentation

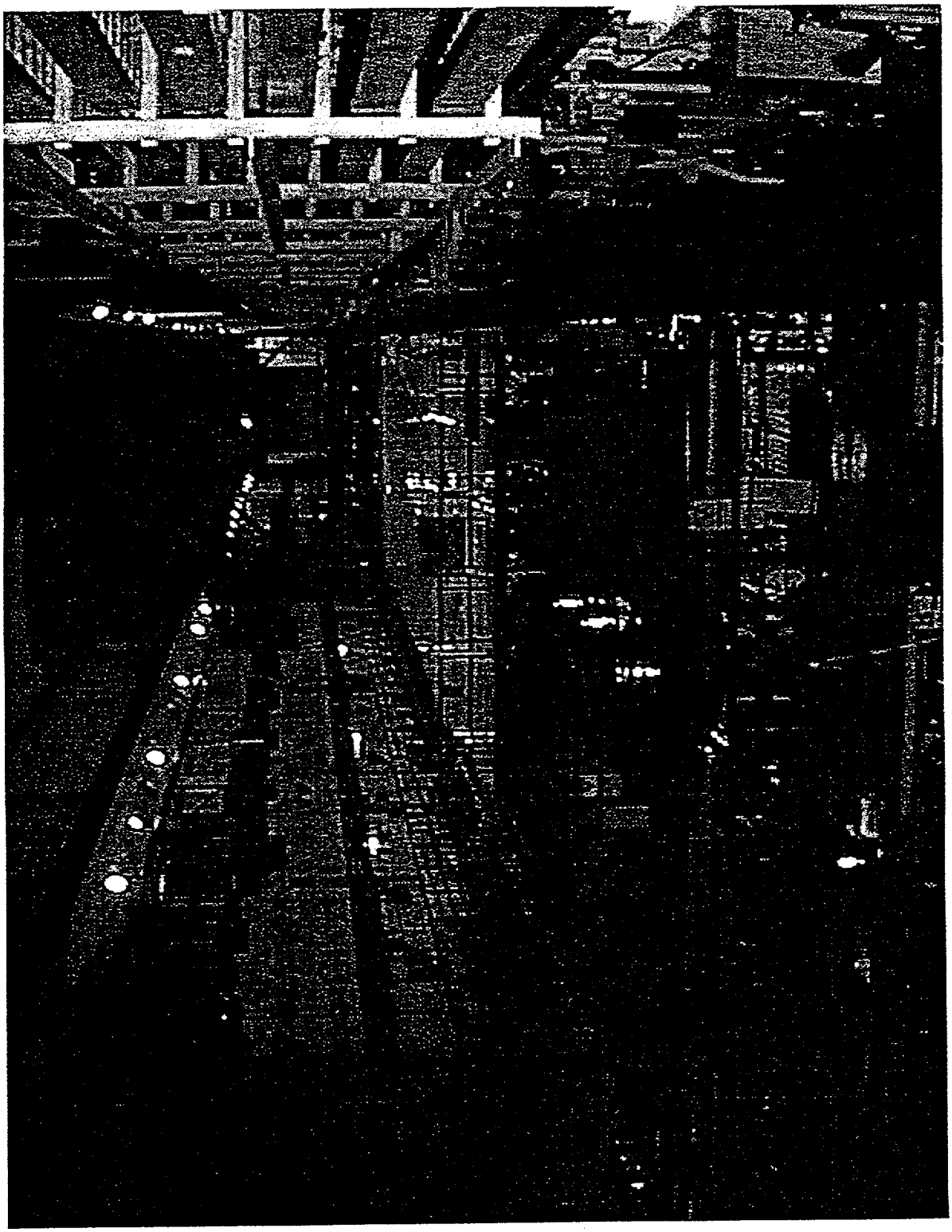
Background (Continued)

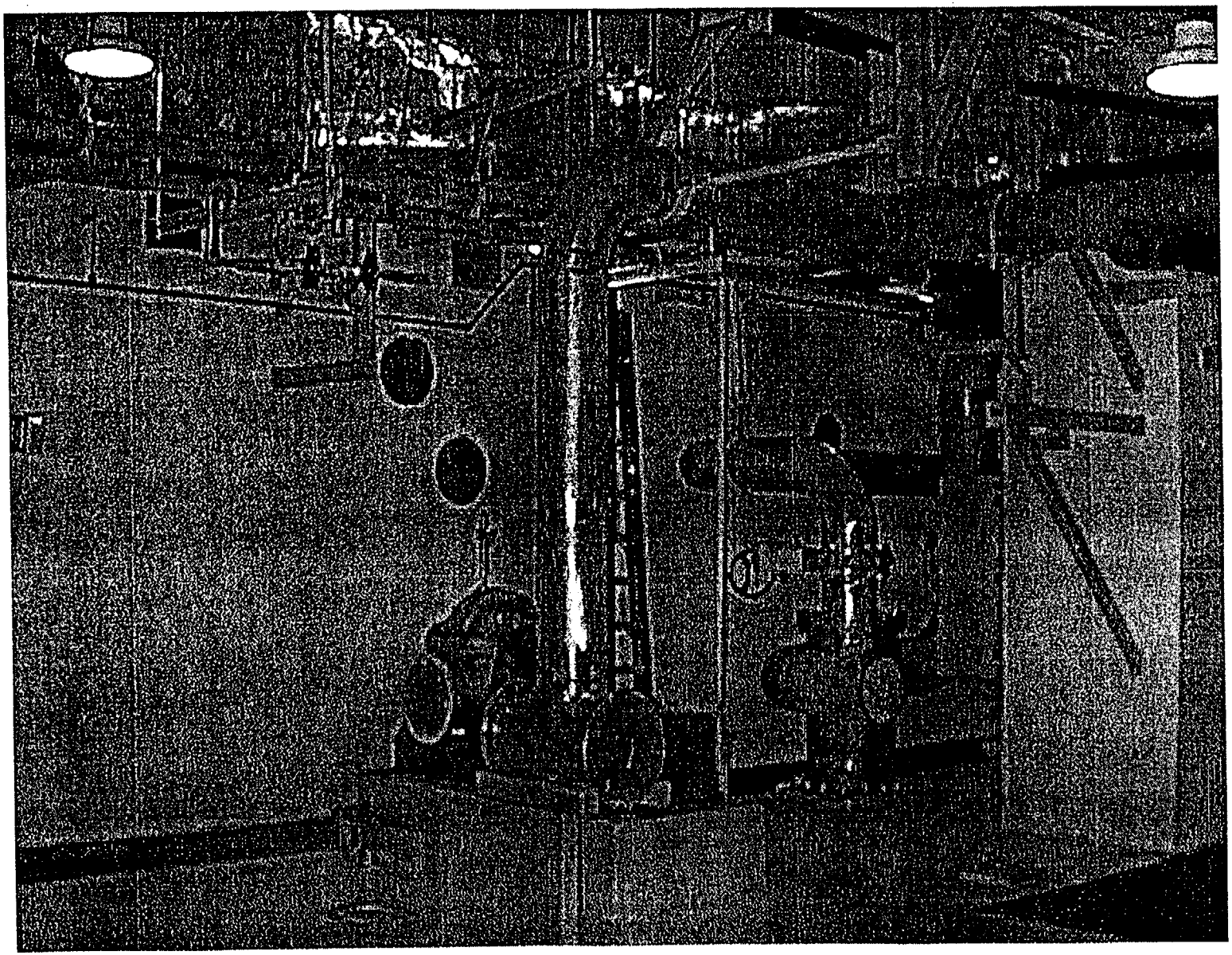
- Alternatives Considered
  - Dry Storage
  - Pools 'C' and 'D' with independent cooling and dedicated emergency diesel generators
  - Pools 'C' and 'D' with cooling from Unit 1 CCW and Unit 1 electrical

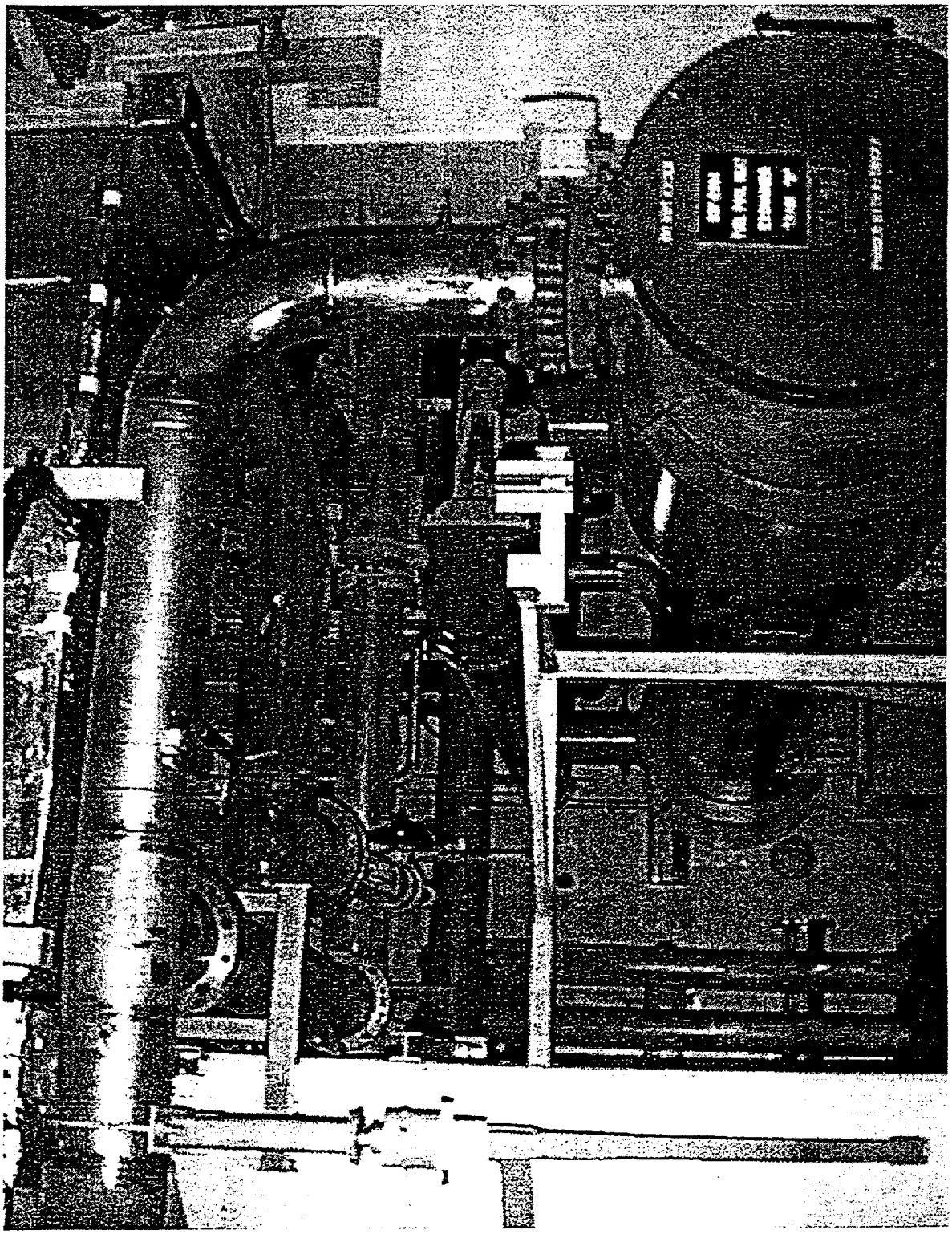
HNP Spent Fuel Pools



Fuel Handling Building - Operating Level (286')







Scope/ Status

- NRC submittal development
  - Tech Spec Change for high density racks
  - 50.59 evaluation for Interim CCW tie-in
  - 10CFR50.55a Alternative Plan for piping welds
  - Related 50.59 evaluations
- Cooling and cleanup system for pools 'C' and 'D'
  - Detailed design in progress
  - Thermal-Hydraulic Calcs
  - Using Unit 1 CCW to provide cooling to fuel pool cooling system

Scope/ Status (Continued)

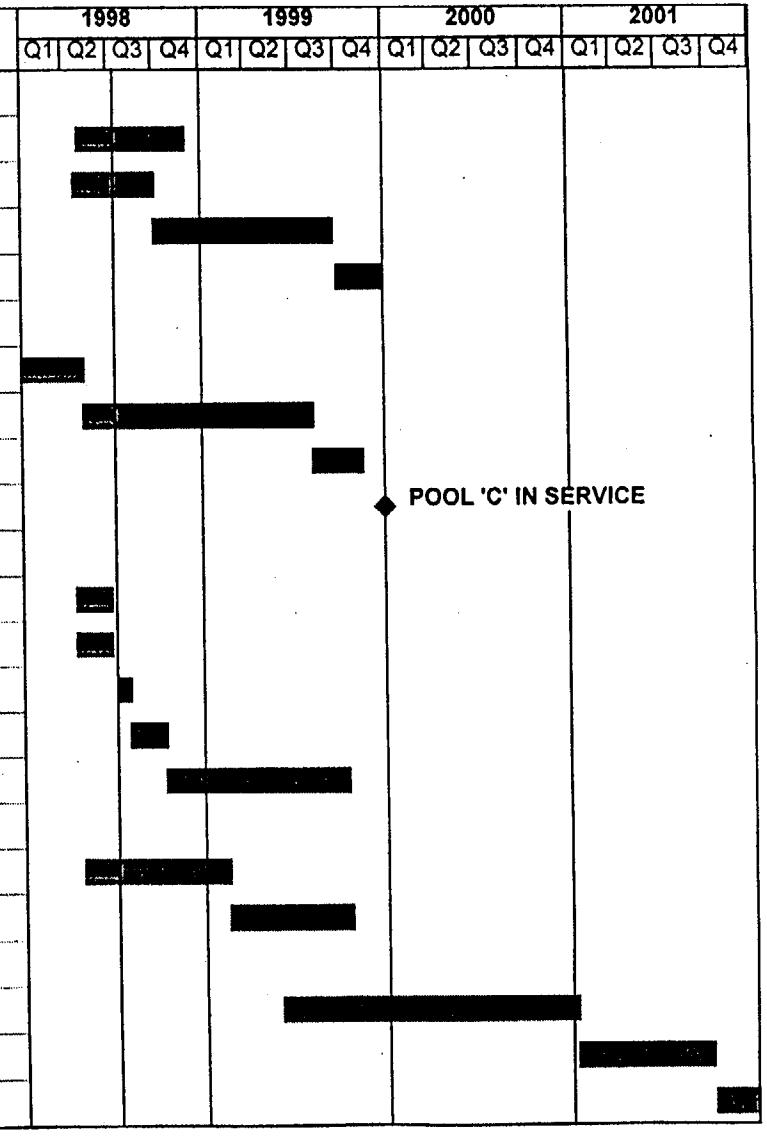
- Phase 1 - Complete fuel pool cooling loop work and tie-ins to CCW
  - Existing system adequate for near-term operation until power uprate is implemented
  - 50.59 evaluation in progress
- Phase 2 - Perform CCW system upgrade concurrent with power uprate
  - Final scoping and detailed design, licensing and implementation to occur after sufficient power uprate analysis has been completed (start mid-1999)

Scope/Status (Continued)

- Storage Optimization Project
  - Design & Analysis for Denser Layouts
  - License Submittal for Tech Spec Change
  - Procure/Fabricate/Install Racks
- Miscellaneous Support Projects
  - Dispose of Unused, Low Density Boraflex Racks
  - Evaluate Cask Basket Hoist Rigging
  - SFP 'D' Cleanup

Schedule

ID	PROJECT	Task Name
1	PHASE 1 COOLING	
2		SFPC DESIGN
3		CCW DESIGN
4		INSTALLATION
5		SYS TEST
6	RACKS	
7		DESIGN/ANALYSIS
8		RACK FABRICATION
9		INSTALL RACKS
10		
11	LICENSING	
12		50.55A
13		T.S. CHANGE
14		NRC MEETING
15		REVISE SUBMITTAL/CCW USQ
16		NRC REVIEW/APPROVE
17	SUPPORT PROJECTS	
18		DESIGN
19		INSTALLATION
21	PHASE 2- CCW UPGRADE	
22		DESIGN
23		INSTALLATION
24		OUTAGE TIE-INS



HNP Spent Fuel Pool 'C' and 'D' High Density Rack Design and Analyses

Project Status

July, 16, 1998

CP&L

Rack Design and Confirmatory Analyses

- Pool Layout and Module Design
- Criticality Safety Evaluations
- Thermal-Hydraulic Evaluations
- Rack Seismic/Structural Integrity Analyses
- Pool Structural Integrity

Original Fuel Rack Design

- Original design for racks in pools 'C' and 'D'
  - Same as existing design for racks in pools 'A' and 'B'
  - Cell Pitch (Center-to-center spacing)
    - PWR racks - 10.5"
    - BWR racks - 6.25"
- SFP Optimization Plan for pools 'C' and 'D'
  - Cell Pitch
    - PWR - 9.0"
    - BWR - 6.25"

Optimized Design

		Additional Cells
● Optimized Pool Capacity		
◆ Pool C -		
■11 PWR Racks	927 PWR Cells	407 PWR
■19 BWR Racks	2763 BWR Cells	101 BWR
	3690	508
◆ Pool D -		
■12 PWR Racks	1025 PWR Cells	345 PWR
◆ Total	4715 Cells	853

Rack Installation Stages

- SFP C - Thirty Racks When Completed
  - First Campaign - 14 racks install 1999
    - 4 PWR racks - 360 cells
    - 10 BWR racks - 1320 cells
  - Second Campaign - 10 racks install 2005
  - Third Campaign - 6 racks install 2014
- SFP D - Twelve Racks When Completed
  - First Campaign - 6 racks install 2016
  - Second Campaign - 6 racks install ????

Design Concepts

- Honeycomb Construction (Used in over 40 Reracks since 1980)
- Free Standing Configuration
- Racks will be Region 2 style
  - Neutron absorber material - Boral
  - Tech Spec controlled PWR enrichment/burnup limitations
  - No BWR enrichment/burnup limitation since criticality analyses performed for maximum reactivity

Criticality Safety Evaluation

- Design Codes and Acceptance Criteria
  - k_{eff}<0.95 (95%/95%)
- Methodology
  - CASMO-3
  - MCNP4a
  - No credit taken for soluble boron
  - Representative Axial Burnup Distribution Considered for PWR fuel

Criticality Safety Evaluation (continued)

PWR Fuel Racks

- Fuel Assembly Types Considered
  - Westinghouse 17x17 Standard, 17 x17V5, and 15x15
  - Siemens 17 x 17 and 15 x 15
  - 5.0 wt% maximum nominal enrichment

Resulting Maximum k_{inf} =0.9459

Criticality Safety Evaluation (continued)

BWR Fuel Racks

- Fuel Assembly Types Considered
  - GE 3,4,5,6,7,8,9,10, and 13
  - 4.6% Maximum Planar Average Enrichment

Resulting Maximum k_{inf} = 0.9443

Thermal-Hydraulic Evaluation

Model Parameters

- 3-D CFD Analysis Performed
- Maximum Decay Heat Load 15.63 Mbtu/hr (Based on Minimum 5 year cooling time)
- Both Pools Included and Considered Completely Full
- No credit taken for environmental losses

Results

Bulk Pool Temperature < SRP Acceptance Criteria

Maximum Local Cell Temperature 143.8°F

Rack Seismic/Structural Integrity Analyses

Modeling Attributes

- Racks are modeled as 3-D structures capable of simulating all realistic motions
- Bounding and intermediate values considered for rack pedestal friction
- A large number of parametric studies performed
- Configurations subsequent to each campaign have been separately analyzed

Rack Seismic/Structural Integrity Analyses (continued)

Key features of whole pool multi-rack (WPMR) Analysis

- Each rack is modeled as free-standing body
- Fuel assemblies assumed to rattle randomly
- Hydrodynamic forces between racks considered

Results

Primary stresses in rack module remain below the allowable stresses of ASME Code Section III, Subsection NF

Pool Structural Integrity

Codes and Standards

- OT Paper, SRP 3.8.4.II.5, ACI 349, TID 7024, consistent with FSAR
- Seismic Category I Structure

Modeling Methodology

- Stardyne Analysis Performed
- 3-D Finite Element Model
- Simplifying Boundary Constraints
- Conservative Load Applications
- Ultimate Strength Method

Pool Structural Integrity (continued)

Applied Loads

Dead Weight

- Racks, Pool Structure, Fuel, Pool Water, Sloshing

Seismic Loads

- Pool Water, Rack Pedestals, Pool Structure Self-Weight, Rack Hydrodynamic Load

Acceptance Criteria

Maintain Pool Integrity

No Local Failures

Summary

- Pool 'C' needs to be in service in early 2000
- Tech Spec Change for high density racks
- High Density Rack Design & Analyses Consistent with Industry Practice

Component Cooling Water System Modification

50.59 Evaluation

July 16, 1998

CP&L

Background

- Harris Nuclear Plant originally envisioned as a 4 unit station
- Cancellation of Units 3 and 4 in 1981 and concerns with the original non-single failure proof design of the Fuel Pool Cooling and Cleanup System dictated the configuration reviewed in NUREG-1038 *"SER related to the operation of Shearon Harris Nuclear Power Plant, Units 1 and 2"*, November 1983
- Unit 2 canceled in December of 1983

Background (Continued)

- The Fuel Pool Cooling and Cleanup System design reviewed in the SER considered the following for both Units 1 and 2:
  - Redundant trains of Fuel Pool Cooling
  - A Fuel Pool Cleanup system
  - A New Fuel and a Spent Fuel Pool
  - Makeup to the the pools via unit specific Refueling Water Storage Tanks
  - Heat rejection via *separate* CCW systems

Background (Continued)

- Unit 1 FPCCS is as described in the SER
- FPCCS is serviced by the Unit 1 CCW system
- FPCCS is serviced by Unit 1 RWST
- Field provisions were added to the Unit 1 CCW System to provide future capability to service the Unit 2 pools (North Pools)

Decision Process

- Preliminary study of the CCW system identified operational margin
- Comprehensive multi-system thermal/hydraulic model was created
- Impact of SGR and Power Uprate
- Review of transshipment schedule
- Two phase approach

Summary

- Adequate operational margin is available for Phase 1
- Rebalance of CCW is required
- Rebalance of ESW is required
- Pool temperatures remain below SRP limits

Thermal/Hydraulic Modeling

Original Methodology	Comprehenstve Model
Used computerized hydraulic models with hand calculations to evaluate thermal performance	The comprehensive model created addressed both thermal and hydraulic aspects of SW, CCW, and FPCC system performance
Conservatively evaluated the off-design performance of the RHR heat exchanger which led to an overestimation of CCW flow required during LOCA/Recirculation	The comprehensive model is able to dynamically model the off-design performance of the RHR heat exchanger and properly estimate CCW flow during LOCA/Recirculation

Based on thorough understanding of the system interactions for the various modes of operation it was demonstrated that adequate margin existed for the anticipated heat loads (1 MBTU/Hr) in the North Pools until the end of 2001

Required Modifications

- The cooling of the North Pools' Fuel Pool Cooling Heat Exchangers will be provided by an extension of the Unit 1 CCW system
- Makeup will be provided by connection to the Unit 1 RWST
- Power requirements will be taken from Unit 1
- FPCC system will be completed as originally designed

Two Phase Modification

- Phase 1
  - Tie into the Unit 1 CCW and take advantage of its existing operating margin
- Phase 2
  - Upgrade the CCW system (impeller upgrades, helper heat exchangers, etc.)

Status

- Heatup calculations for the North Pools are not complete
- UHS evaluations are not complete
- Fuel Handling Building HVAC evaluations are not complete
- Minimum Time to Offload evaluations are not complete

50.59 Evaulation

- PUR/SGR will impact the CCW system
  - Provide interim methodology to control pool heat load
- Change to the facility as described in the FSAR
  - SER evaluated 2 separate FPCC systems each with its own supply of CCW and makeup from the RWST (Note: Current operating practice for the South Pools is in agreement with the FSAR/SER)
  - CP&L's proposed activity will require the use of Unit 1's CCW and RWST for the North Pools
  - Power requirements will be taken from Unit 1

Conclusion

- The 10CFR50.59 evaluation is still in development
- Methodology to control the heat load in the North Pools is required

10CFR50.55a Alternative Plan for Harris Spent Fuel Pool 'C' and 'D'

July 16, 1998

CP&L

Discussion Topics

- Introduction
- Background
- 50.55a Alternative Plan
  - Piping Pedigree Plan (Section III and B31.1)
    - Scope
    - Records Retrieval
    - Examination/Testing
    - Reconciliation
  - Construction Continuance
- Conclusions/Summary

Background

- Original HNP Design
  - Four (4) nuclear units; four (4) fuel pools; two (2) cooling systems
  - Pools 'A' and 'B' to support Units 1 and 4
  - Pools 'C' and 'D' to support Units 2 and 3
  - A separate, fully-redundant, 100% capacity cooling and cleanup system for each set of pools
- Units 2, 3 and 4 canceled in early 1980's,
  - All four pools completed
  - Pools 'A' and 'B' placed in service
  - Cooling system for pools 'C' and 'D' was not completed
    - Construction stopped when unit 2 canceled in 1983

Background (Continued)

- Plan at time of Unit 1 license was to complete cooling system and place pools 'C' and 'D' in service when necessary
- Fuel Pool 'C' is needed in early 2000 to support spent fuel shipping requirements from BNP and RNP
- Some field installation documentation not available
  - Inadvertently discarded by document services in 1993
  - System cannot be certified to ASME Section III without all documentation
  - 10CFR50.55a Alternative Plan required

Background (Continued)

- NRC submittal development
  - Tech Spec Change for high density racks
  - 50.59 evaluation for Interim CCW tie-in
  - 10CFR50.55a Alternative Plan for piping welds
  - Related 50.59 evaluations
- Fall submittal planned

10CFR50.55a Alternative Plan

Project Update
July 16, 1998

CP&L

Regulatory Requirements - Construction Codes and Standards

- 10CFR50.55a requires
  - structures, systems and components be designed, fabricated, erected, constructed, tested and inspected to quality standards commensurate with the importance of the safety function they perform
  - Systems and components of nuclear power reactors must meet requirements of the ASME B & PV code consistent with their quality classification
    - For Spent Fuel Pool Cooling, the SRP assigns quality group "C", correlating to ASME Section III, Class 3 Construction requirements

Harris Construction Chronology

- 1971 - CP&L files construction application for four unit plant at New Hill, NC
- 1978 - AEC issues construction permits
- 1981 - CP&L cancels Units 3 & 4
- Nov. 1983 - NRC issues SER for Units 1 & 2 (NUREG 1038)
- Dec. 1983 - CP&L cancels Unit 2
- Jan. 1987 - Unit 1 full power operating license issued
- May 1987 - Unit 1 begins commercial operation

Spent Fuel Storage Facilities - Current Configuration

- Fuel Handling Building completed
  - Embedded piping installed, inspected and tested
  - HVAC system completed
- Unit 1 (South) A and B Spent Fuel Pools and supporting systems completed, operating
- Unit 2 (North) C and D Spent Fuel Pools installed, but supporting systems not completed
  - Spent Fuel Pool Cooling major equipment installed
  - Majority of Spent Fuel Pool Cooling System piping installed
  - Significant portion of CCW piping in Fuel Handling Building installed; but no Unit 2 CCW and RWST available

Completing North Spent Fuel Pool Facilities - ASME Code Compliance

- Partially completed systems were never issued a Partial Data Report
  - No partial N stamp on completed portion of construction
  - Original N Certificate Program no longer maintained
- Field installation records for piping discarded
  - Records purged during document control cleanup effort
  - Includes Code required records for weldments

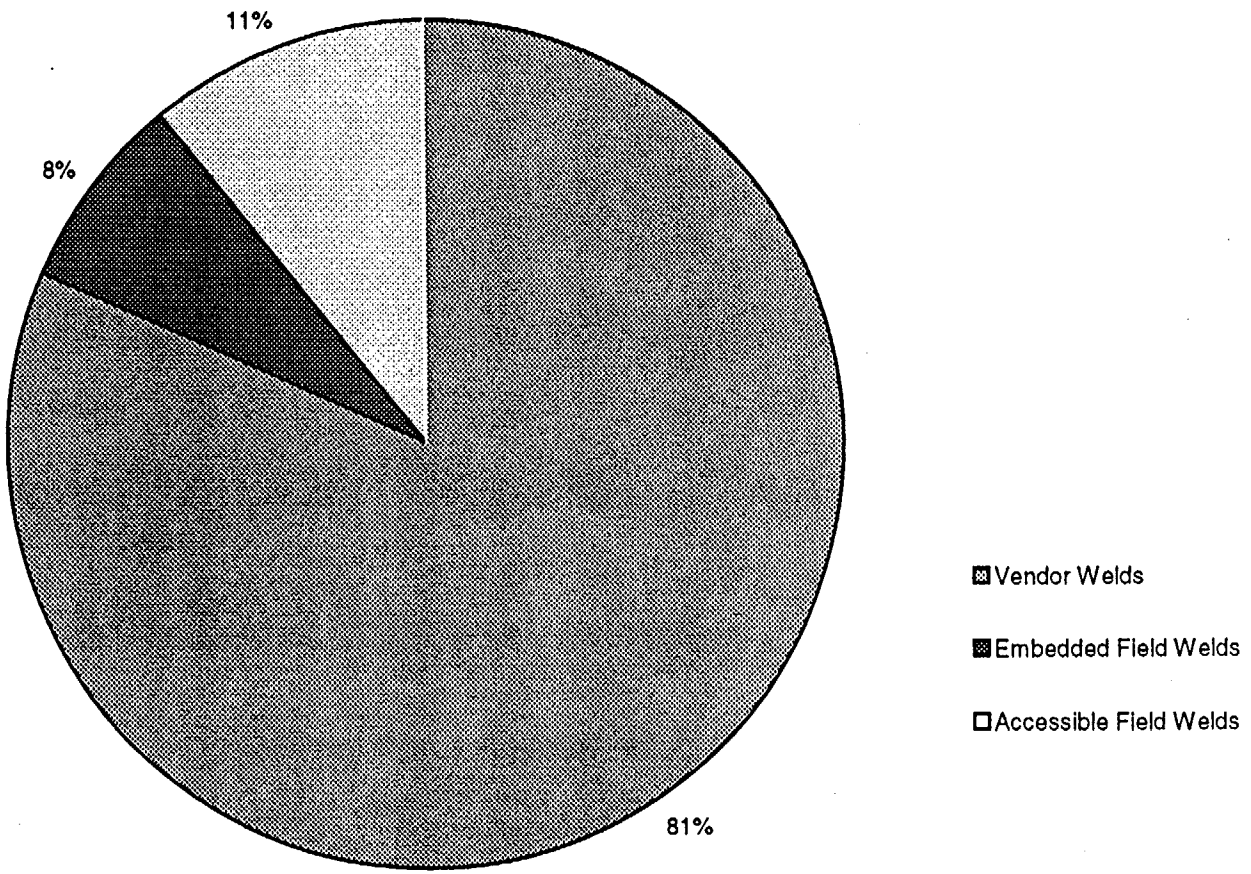
Conclusion

- Cannot satisfy ASME code requirements in completing North Spent Fuel Pools Cooling Systems using originally constructed portion of piping
- "Alternative Plan" per 10CFR50.55a(3) necessary for completion of construction
  - Requires demonstration of "acceptable level of quality and safety" or hardship without compensating increase in quality and safety

Alternative Plan Scope - Two Parts

- Piping Documentation (Pedigree Plan)
  - Section III piping
    - Large Bore SFP piping
      - <40 field welds of approx. 200 total welds
    - Large Bore CCW piping
      - small scope, <10 field welds
  - B31.1 piping
    - purification, skimmer, aux systems
- Construction Continuance (N stamp issue) Requires
  - Applicable to piping within Section III boundaries

North SFP Cooling System Large Bore Section III Welds (Approximately 200 total welds)



DOCS:

Piping Pedigree Plan - Elements

- Scope Definition
- Records Retrieval
- Examination / Testing
- Reconciliation

Piping Pedigree Plan - Scope Definition

- Scope Definition
  - Field Walkdowns - ascertain boundaries of completed piping
    - Section III
      - SFP Cooling System
      - CCW System
    - B31.1
      - Purification, Skimmer, Waste Treatment, Service Air, Demin Water
  - Documentation Status
    - Determine if appropriate field installation records available

Piping Pedigree Plan - Records Retrieval

- Procurement documents
  - Receipt Inspection Records, Vendor Data Packages retained in Harris Document Control
- Elements of the Construction Program
  - Work control procedures (welding, hydrotest, concrete placement, etc.) materials control procedures, specifications
- Construction era documents
  - hydrotest records, concrete placement slips, NCRs, DDRs, pipe spool mods, etc
- Other records
  - engineering files, QC log books, mod records

Piping Pedigree Plan - Examination / Testing

- Section III Piping
  - LP and visual examination of accessible welds
  - filler material verification of accessible welds
  - welder identification / qualification for accessible welds
  - internal inspection where feasible
  - hydrotesting per Section III
- B31.1 Piping
  - Visual examination of accessible welds
  - filler material verification for representative population
  - welder identification / qualification for accessible welds
  - hydrotesting per B31.1

Piping Pedigree Plan - Reconciliation

- Develop Body of Evidence Demonstrating Quality
  - Compile Historical Records
  - Develop / assess programmatic assurances
  - Compile Examination / Test Records
- Compare to Code construction requirements
- Assess if acceptable level of quality assurance / safety is provided

Piping Pedigree Plan Status - Scoping

- Field Walkdown
  - Large majority of SFP Cooling installed
    - includes embedded portions of all eight fuel pool cooling lines to and from the "C" and "D" pools
  - Majority of CCW piping within Fuel Handling Building installed
  - Installation of B31.1 systems nearly complete
    - Purification, skimmer, demin water, service air
- Documentation
  - Piping field installation packages unavailable
  - Equipment installation packages are on hand

Piping Pedigree Plan Status - Scope Definition

- Section III scope to include large bore SFP and CCW piping only
  - small bore piping socket welded; difficult to verify filler material
  - lack of substantial "hardship" associated with replacement of these small bore welds
- B31.1 scope to include all previously installed portions
  - includes accessible and embedded piping
  - large scope, but little safety significance

Piping Pedigree Plan Status- Records Retrieval

- Essentially complete for SFP Cooling System
  - vendor data packages exist in document control, contain code records for piping origin, as well as documentation for over 75% of welds within Section III portion boundaries
  - hydrotest records for embedded piping provide record of weld documentation review for embedded welds
  - misc. QC records contain additional information pertaining to accessible and embedded piping
  - procedures and specifications provide assurance of work quality and material control

Piping Pedigree Plan Status - Examination / Testing

- Field Walkdown of accessible Section III SFP Cooling Piping Complete
  - 100% Visual Exam and LP accessible field welds
  - 100% identification of welder and qualification for accessible field welds
  - Verification of field welds vs. shop welds
  - Detailed internal inspections - generally not feasible
- Filler material verification
  - 100% of accessible field welds in Section III SFP Cooling Piping completed

Piping Pedigree Plan Status - Reconciliation

- Vendor data packages are on hand, provides Code required records for origin of piping, large majority of all welds
- For accessible field welds
  - Field weld quality verified through re-examination
  - Filler material verified through examination & testing
  - Welder identification established, qualification verified
- Hydrostatic test records exist for embedded piping
  - Includes record of weld documentation review for embedded field welds
- QC records provide additional information

Piping Pedigree Plan Status - Reconciliation

- Conclusions
  - Code required records on hand for majority of welds in vendor data packages, only field welds at issue
  - Direct verification of quality possible for accessible field welds
  - Lack of direct records and access for additional examination warrants additional review of quality for inaccessible welds

Piping Pedigree Plan - Additional Assurances of Quality

- Uniform construction program
  - One N certificate program, quality assurance program for the entire site
  - Generally, a common pool of craft, QC, ANI, and engineering for all units
  - Common warehouse / materials issue facilities
  - same stock of filler materials, consumables
  - Sitewide construction procedures
  - Common piping specification

Piping Pedigree Plan Status - Additional Assurances of Quality

- Programmatic assurances
  - site specification for filler material
    - Only provided for procurement of Section III stainless steel filler material
  - procedural requirements and controls
    - required review of construction records at appropriate milestones
    - materials control procedures for piping, filler metals

Piping Pedigree Plan Status - Additional Assurances of Quality

- Other records
  - QC log books
  - Interviews with personnel from construction era
- Quality of embedded field welds substantiated by satisfactory examination / testing of accessible field welds

Piping Pedigree Plan - Summary

- Code required records were created during construction, but have since been discarded
- Quality comparable to that of Unit 1, which was licensed and has been in operation with no history of significant construction quality issues
- Overwhelming body of evidence supports that completed portions of Unit 2 Spent Fuel Pool Cooling Quality Group "C" piping was constructed to ASME Section III requirements
- Equally important, there is no evidence or bases which would reasonably lead to the conclusion that this piping lacks in the required level of quality

10CFR50.55a Alternative Plan - N Stamp Issue

- Completed systems cannot be N stamped using originally constructed portions of piping
  - No partial N stamp issued for this piping
  - No provision in Code to allow new N certificate holder to assume responsibility
- Majority of Section III piping (both accessible and embedded) already installed
- Ripout of existing piping (particularly embedded portions) to facilitate N stamping would represent undue hardship with no compensating increase in quality or safety

10CFR50.55a Alternative Plan - N Stamp Issue

- Consulted with Code Authorities
  - Confirmed that previous construction cannot be N stamped
  - Determined that completion of System does not meet definition of replacement in Section XI, but Section XI R & R Program does provide a quality assurance program with acceptable level or rigor
  - Design and construction should be completed to Section III to the extent possible

N Stamp Issue - Summary

- Cannot N stamp North Spent Fuel Pool Cooling Systems using original construction
- Proposed approach for construction continuance is to complete system design and construction to Section III, use Section XI program for QA
  - Conservatively reconcile conflicts between Section III and XI
  - Requires concurrence from NRC, NC Dept of Labor, Insurer (ANI)

10CFR50.55a Alternative Plan Conclusions

- Piping Pedigree Issue pertains to deficiency in documentation requirements, not quality of construction - requisite level of quality does exist in original constructed portions of North Spent Fuel Pool Cooling Systems
- Completing design and construction to Section III using Section XI program for QA provides acceptable level of quality and safety for continuance of construction

2009 Chapel Hill Road
P.O. Box 61051
Durham, NC 27715-1051
Phone: (919) 490-0747 Fax: (919) 493-6614
E-Mail Address: NC-WARN@POBOX.COM

Waste Awareness and Reduction Network
NC WARN

October 20, 1998

William Cavanaugh, C.E.O.
Carolina Power & Light, Inc.
P.O. Box 1551
Raleigh, North Carolina 27602

Subject: High-level waste expansion at Shearon Harris

Dear Mr. Cavanaugh,

I am writing in regard to the license amendment process for CP&L's upcoming application to expand high-level nuclear waste storage at the Shearon Harris plant. I understand that application will be submitted some time in the next 60 days.

As you know, the nuclear power industry faces enormous challenges now and over the coming decades in its attempts to ensure the safe long-term handling and storage of high-level waste (HLW). The Nuclear Regulatory Commission (NRC) has acknowledged the possibility of a serious accident, possibly catastrophic in terms of radioactive release, from the nation's HLW storage pools. CP&L and other utilities have experienced a number of "incidents" regarding HLW storage, some of which have been termed "near misses" (to serious accidents) by nuclear safety engineers.

Meanwhile, there is a significant possibility that a permanent national disposal site may be decades from opening. That uncertainty, coupled with the fact that HLW storage pools were designed only for short-term storage, increases the possibility of a serious accident at any particular HLW facility, including the Harris plant.

As you know, the nuclear power industry has been plagued, since its inception, by much bad faith with the public, in part due to the unwavering secrecy in which the industry operates as well as its unwillingness to openly and honestly address operational problems and exposures to workers and communities. Additionally, the NRC has long been criticized — to this day in fact — for acting more as a promoter of the industry than a regulatory body.

CP&L's secrecy on this HLW expansion is yet another and current example. The public is only now learning, through our efforts, of this proposal which has been in the planning stages for many months. NRC perpetuates this climate of secrecy with a closed door policy to the public which provides for no notification of the license amendment and, in fact, requires a legal challenge as the only potential for participating in the process.

We now call on you and CP&L to step beyond the restrictions of such a narrow regulatory framework. Your current ad campaign boasts "The power to lead". We ask you now to provide leadership, to break the industry mold of secrecy and mistrust. We ask that you make a formal commitment to open the process, to formally notify the NRC that you wish to waive the restrictions regarding public participation.

E/12

Mr. Cavanaugh, this is your chance to create a new paradigm, where industry, government and citizens can come together to review and discuss the issues. We may all reach agreement on the best way to proceed with the nuclear waste dilemma, but at the least we can disagree after having a fair and honest assessment of all the information.

NC WARN joins hundreds of citizen groups across the nation who justifiably feel the NRC doesn't represent our interests. We therefore have legitimate concerns whether there would be an unbiased evaluation and consideration of this important public policy issue unless you agree to allow public involvement.

Despite a lack of access to all pertinent information, NC WARN and its consultants have already identified a number of questions and concerns regarding the technical aspects of the project. We can find no precedent for various of your initiatives, including the cooling configuration and the size of your HLW storage plan, which apparently would become one of the largest, if not the largest, in the nation.

A free flow of information is vital to democratic society, especially regarding issues of paramount importance to public safety. Therefore, we are also calling on state and county officials to join this collaboration toward public assurance regarding CP&L's waste plans.

Please be advised that we are requesting genuine access — not symbolic gestures. We ask you to join NC WARN in co-sponsoring a public participation effort which addresses the public concerns in an efficient and timely manner. Should you continue to operate in secrecy, the public will be justified in assuming that you have reservations about your HLW plan or concerns that it cannot stand scrutiny from outside the industry and a regulatory body which is historically beholden to that industry.

Nuclear waste is an extremely problematic policy area which will clearly take much attention and energy to resolve during the next generation. We feel this issue deserves the very best effort that society can muster to resolve, an effort which requires the best minds from industry, government and the public. We hope that you will provide the leadership to make this a reality.

Scientists may disagree about how likely a serious accident may be. But no one denies the potential is there. Due to the impact a serious HLW accident could have on literally hundreds of thousands of North Carolina residents, this HLW plan is not a private matter for CP&L. It is a very important public policy issue which deserves — in fact requires — an open process. The people of North Carolina have a right to be at the table, a right to know about the threats from your facilities.

I look forward to your prompt reply to this request.

Sincerely,

Jim Warren
Executive Director

cc: Governor Jim Hunt
Shirley Jackson, Nuclear Regulatory Commission
regional county governments

Jury, Keith

From: Manning, Pat
Sent: Tuesday, October 20, 1998 11:40 AM
To: All Exchange CP&L Personnel (1); Barbara Perkins; Barbara Tindall; Beaty, Becky; Bill Scott; Carl Webb; Dan Knox; Dave Moody; David Loos; Dori Wilson; Elliott, John; Ginger Duncan; HR-HR Business Services; Interpath IC Staff; Jack Spain; John Taylor; Jones, Galen; Kasey Barber; Kate Clayton; Kay Murphy; Kent Hudson; Kevin Lewis; Lee Prevost; McKeown, Richard; O'Dell, Donny; Paul Ogle; Randy Schrader; Rob Duke; Rob Moyer; Ron Clanton; Steve Root; Strategic Planning - Employees; Tate, Forrest; Tom Knox - VP SRS
Subject: Infobulletin (News conference to be held outside Center Plaza Building today at noon)

News conference to be held outside Center Plaza Building today at noon

CP&L has been notified that an organization known as NC WARN will hold a news conference in front of the Center Plaza Building at noon today to address CP&L's plans to activate two already-built spent fuel pools at the Harris Nuclear Plant.

Information about CP&L should come from designated individuals responsible for that task. Employees are reminded to refer reporters or others to CP&L's Corporate Communications Department. The department operates a 24-hour news line at (919) 546-6189.

CP&L has begun the process of obtaining approval from the Nuclear Regulatory Commission (NRC) to make modifications necessary to activate two already-built spent fuel pools at the Harris Plant.

The plant, which began commercial operation in 1987, was originally designed for four units. Common support facilities, including a fuel handling building, were required to be built to support the operation of Unit 1, the first unit to be placed into service. As plans and regional electrical demand projections changed, the remaining three units were canceled.

Harris currently has two spent-fuel pools in operation in the fuel handling building, and the activation of the two other existing pools is aimed at preparing for future storage needs.

Nuclear fuel is used – as is coal, oil or natural gas in other power plants – to create heat to produce steam. The high-pressured steam forces a turbine to turn, producing electricity. As with other types of fuel, nuclear fuel must be replaced periodically (although in other generation processes, the replacement of fuel is continuous). And the used nuclear fuel is immersed in a pool where it can be monitored and moved, ultimately, to a permanent storage facility.

CP&L Senior Vice President and Chief Nuclear Officer Scotty Hinnant said the activation is needed because of the lack of movement on siting and building a federal repository.

"The U.S. Department of Energy has been under legal obligation for a number of years to take ownership of all spent nuclear fuel in the United States, and ultimately, to store it in a deep underground repository," Hinnant said. "CP&L and other utilities with nuclear power plants have paid hundreds of millions of dollars into a federal waste fund over the years for the construction of a centralized storage facility.

"Unfortunately, the Department of Energy has not lived up to its obligation. Its spent fuel storage facilities are not available and are not expected to be available for the foreseeable future. Therefore, CP&L and all

F/13

other nuclear utilities are forced to store all their spent fuel themselves."

The Harris Plant stores spent fuel from its own reactor and from the Brunswick and Robinson plants.

"CP&L is in a much better position than many other companies in that Harris Plant has enough spent fuel storage capability to handle all the spent fuel from CP&L's nuclear units through the end of their current operating licenses," Hinnant said. "Many other utilities are having to build expensive dry cask storage facilities in order to keep operating."

CP&L is seeking federal and state approval to complete the cooling systems and to make other modifications needed to bring the facilities into service. CP&L expects to submit a request to the NRC in October 1998, and anticipates the NRC's review process will take about a year. CP&L's plans call for the third pool to be in service by early 2000. The fourth pool would not be needed for several years thereafter; however, it is more efficient to include the plan for the fourth pool in the overall NRC review request now.

###

Corporate Communications